Municipal Solid-State
STREET LIGHTING
CONSORTIUM

Sponsored by the U.S. Department of Energy

San Jose's "Smart" LED Streetlights: Controlled

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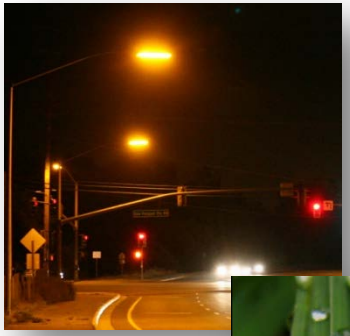
CSJ Streetlight Program - Background

- 62,000 streetlights
- O&M cost: $6M annually
- 2007: Green Vision
  - Reduce energy consumption
  - Use 100% renewable energy
- 2008: Revised Streetlight Policy
- Optimize Energy Savings
  - Remote/Programmable Dimming

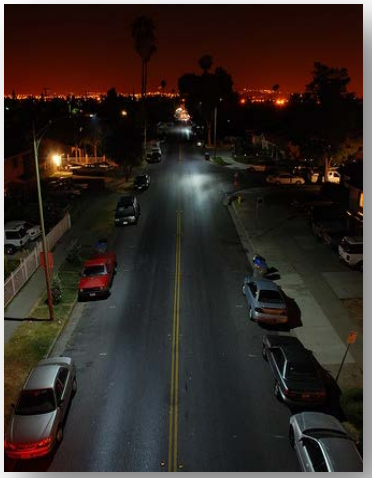


LED for Roadway Lighting

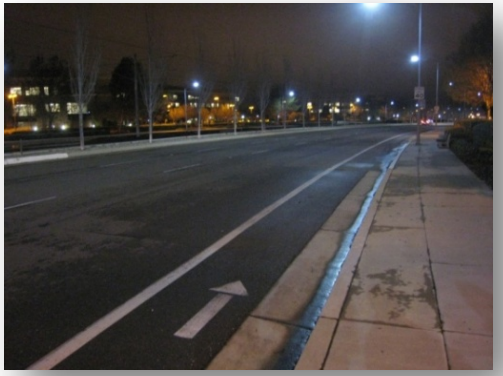
- Energy efficient
- Long lasting
- Directional
- Uniformity
- Quality Color Rendition
- No hazardous waste
- Dimmable

Pilot Projects

City dispatch frequency test
2008



Residential/Powerline test
2009



Industrial/Wireless test
2009

Demo of various lights sources
2010

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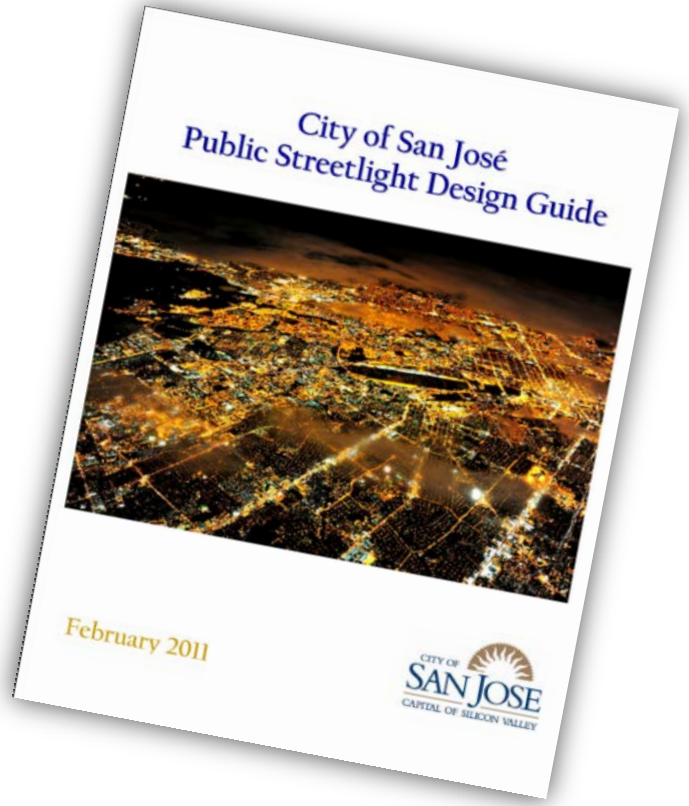
Public Streetlight Design Guide

- Adopted February 2011
- Streetlight Replacement Guide
- Streetlight Installation Guide
- Adaptive Lighting Design Guide

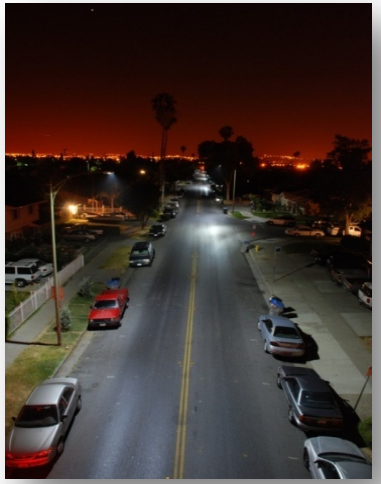


Comparison Metrics

	Old Standard (LPS)	New Standard (LED)
Color Recognition & Visibility	Poor - Fair	Excellent
Public Response	Negative	Positive
Energy Cost /Year	$4 million	$2.4 million - $1.6 million
Replacement Cycle	3 years	10+ years
Payback		10+ years (currently)
Hazardous Waste	Yes	No
Programmable	No	Yes

LED and "Smart" Controls

- Goal: Increase Energy Savings
- Strategy: "Smart" Control System
  - Remote/Programmable Dimming
    - Lighting based on activity level
    - Reduce energy use
    - Minimize light pollution
  - Consumption Data thru Metering
    - Pay for actual energy consumed



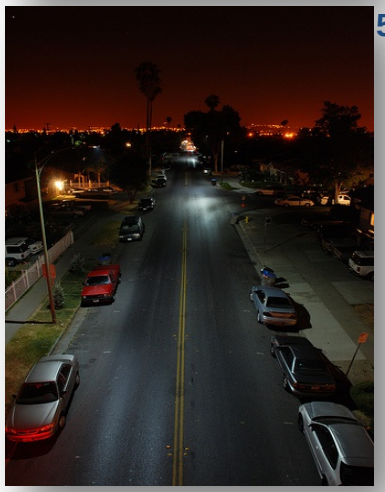
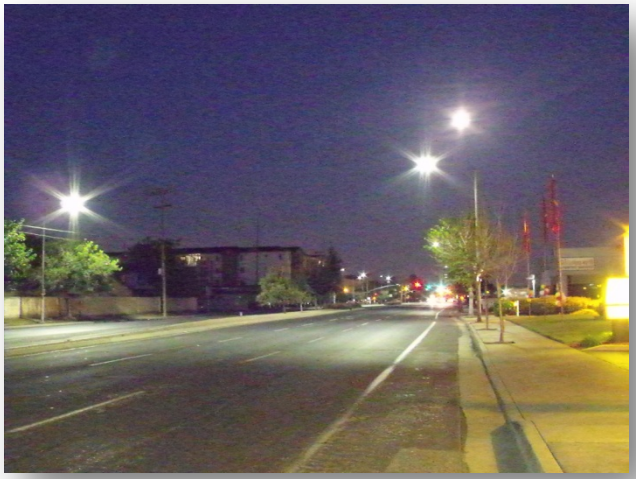


Photo Source: PG&E Emerging Technology/Energy Solutions

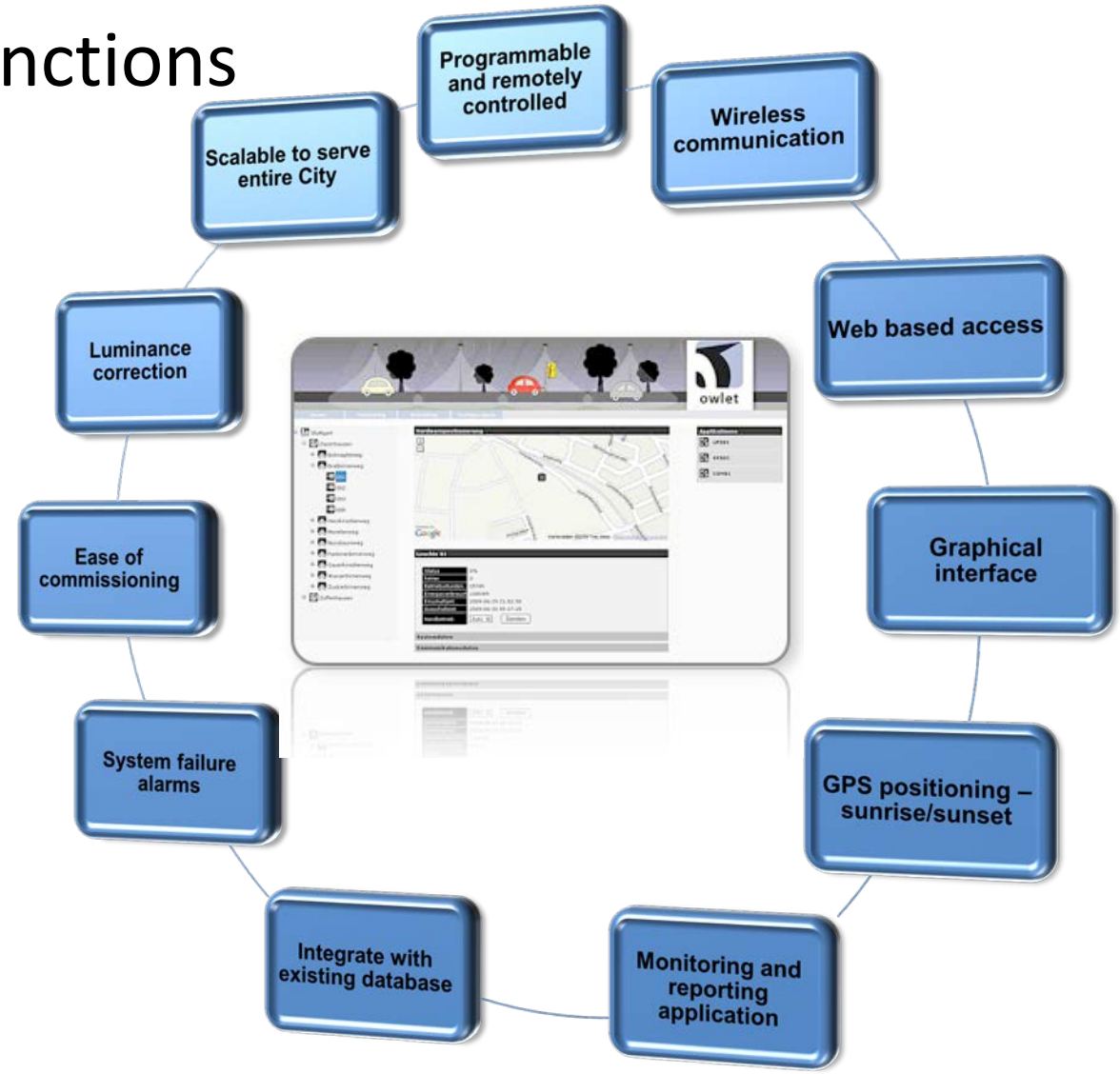
Current Projects

- Policy Direction
- Pilots
- Design Guidelines
- RFP

Convert to 2,000+ "smart" LED lights by end of 2012

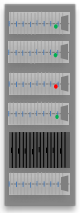


System Functions

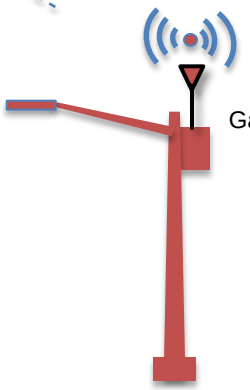


"Smart" Control System Architecture

Central
Management Server

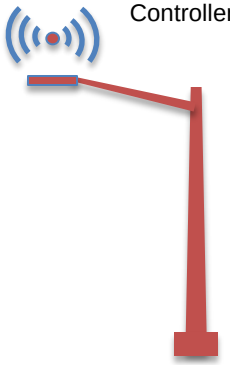


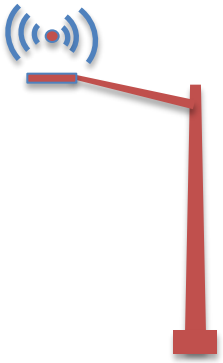
Local interface

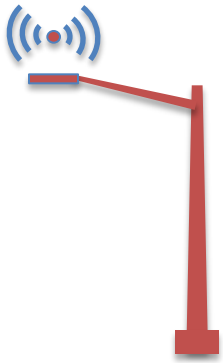


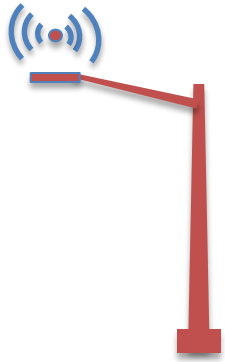
Gateway Controller

LED Luminaire with
Controller Nodes

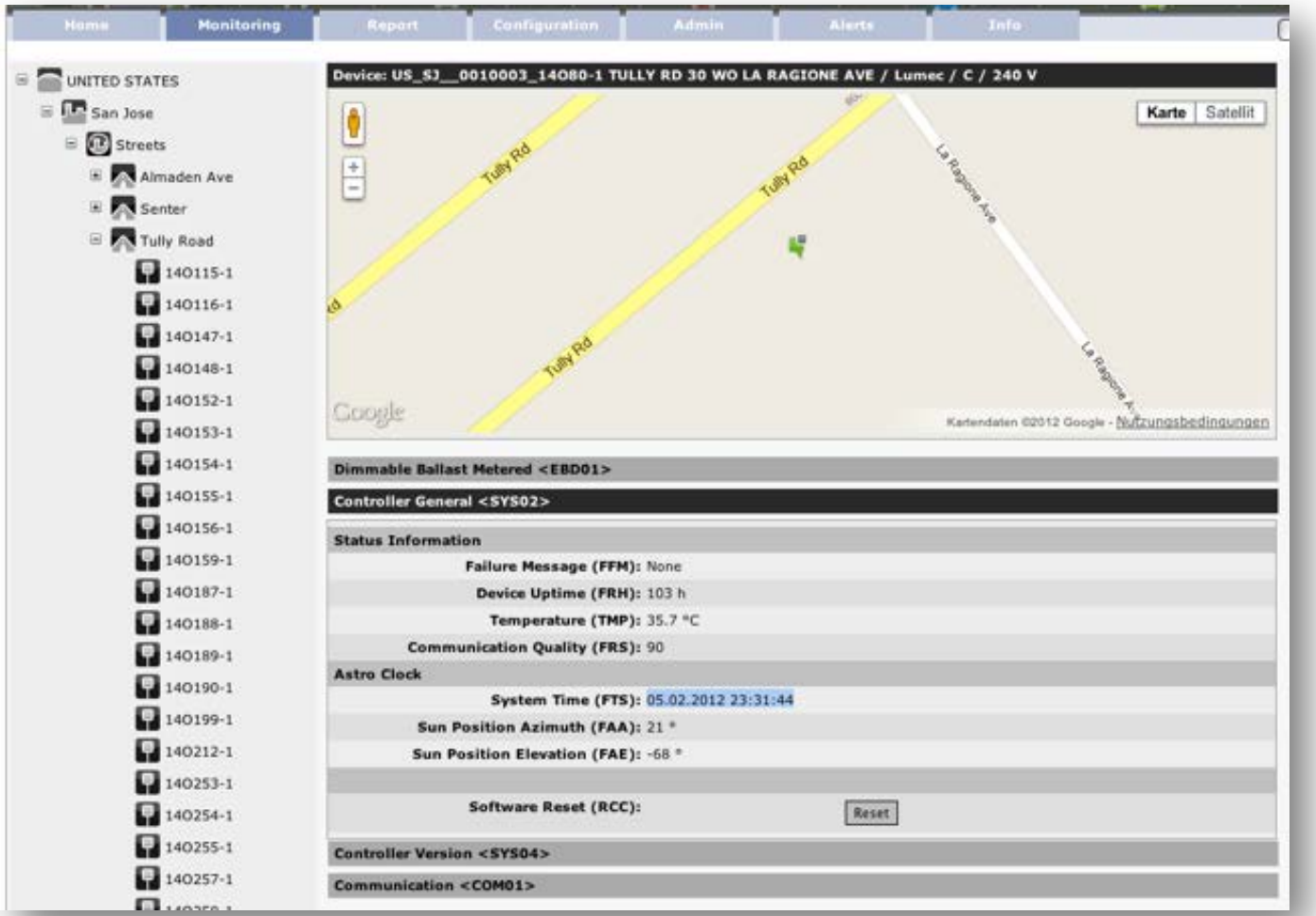








Interface - Reports



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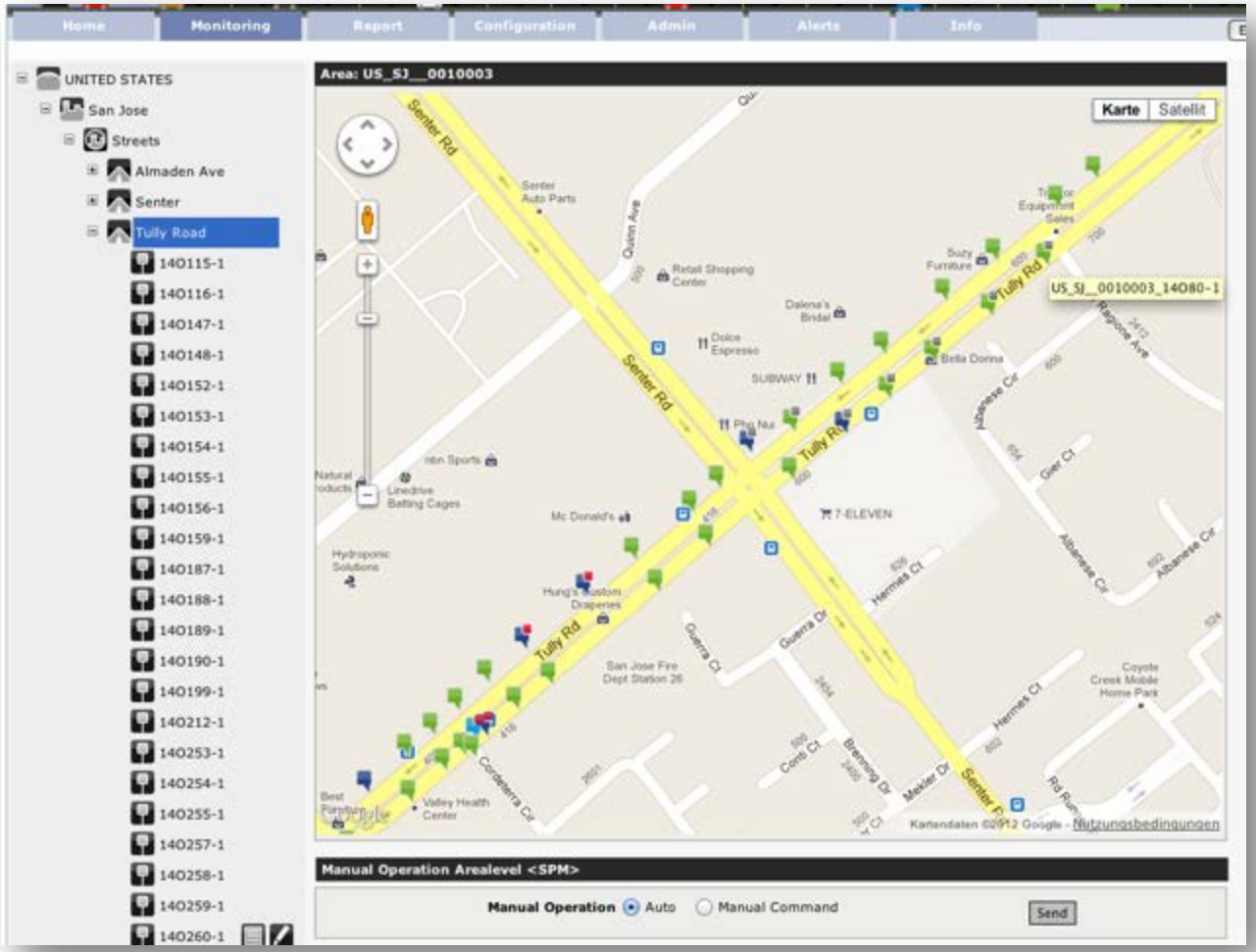

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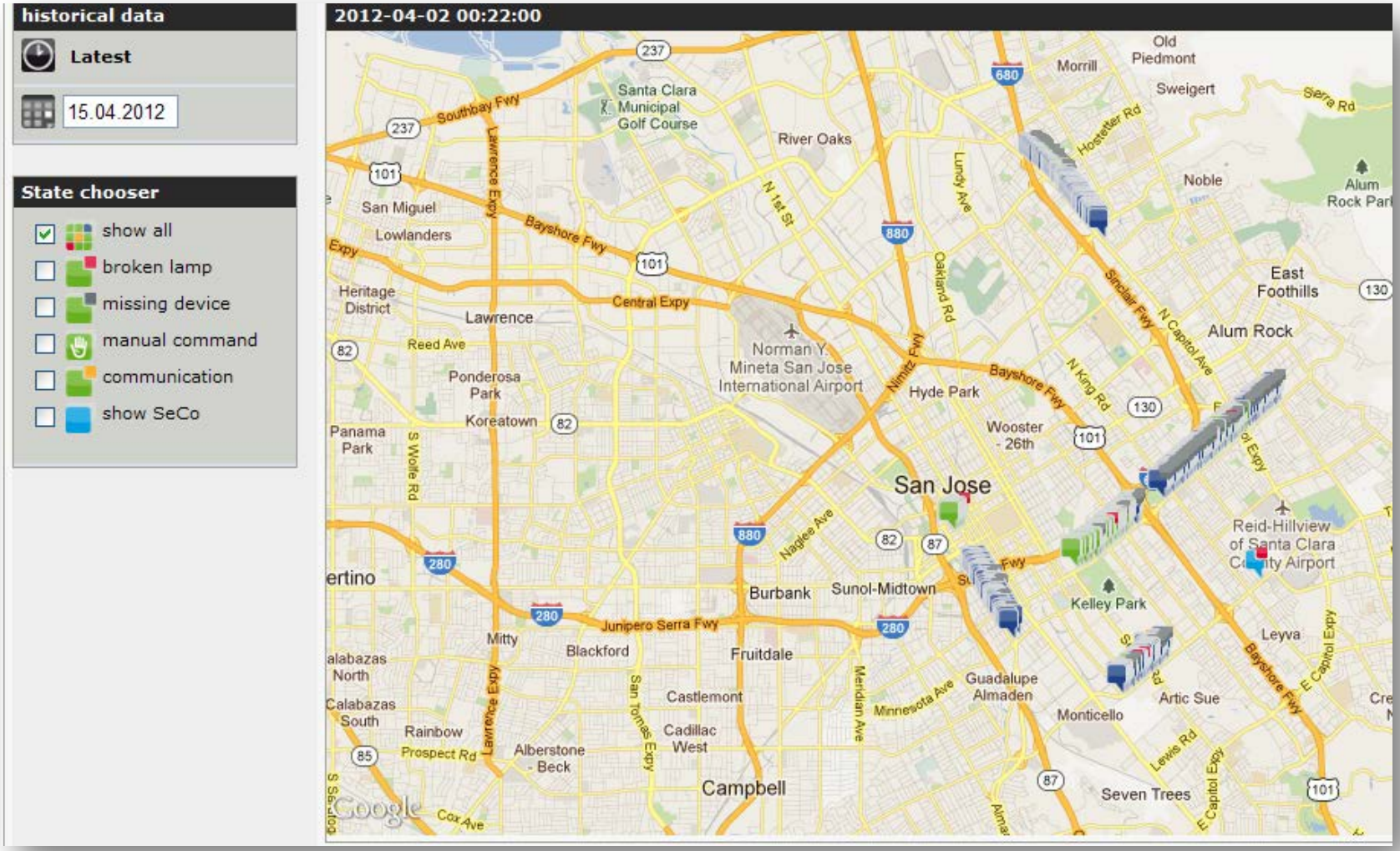

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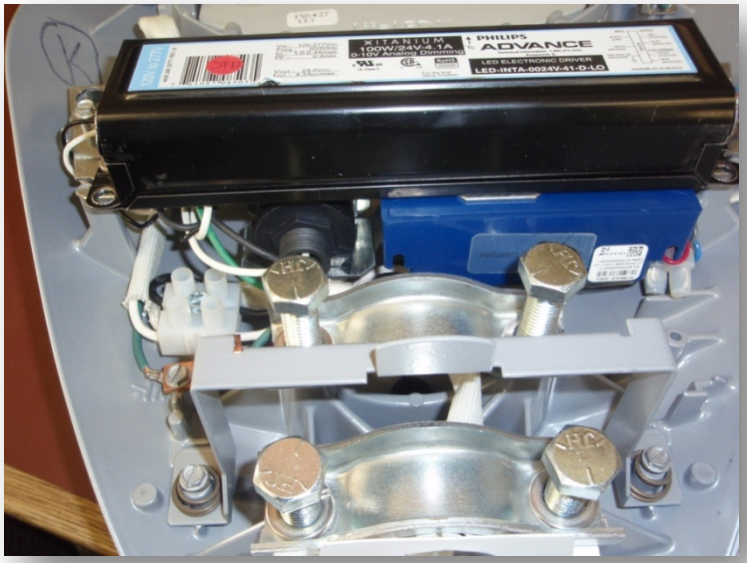

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Commissioning

"SMART" LED Streetlight Monitoring and Control System
Senter Road 2-1-12
Model #C: GPLM-130W98LED4K-LE3-VOLT-DMG-**-PHS-USA-NP

2/2/2012
1 of 1

SeCo 1-26	SeCo Router Address	Badge #	[16-Digit ZigBee Label]	Google GPS Coord. Latitude	Google GPS Coord. Longitude	Street	Luminaire Mfg	Model #	Voltage	Pole Type	Type Removed	Wiring	Comments
		140149	1O27JL0 [[G]]	-121.84865588500	37.30869595670	Senter Rd	Lumec	C	240	☐ TS ☐ Oct/Galv ☐ Oct Painted ☐ Type 15 ☐ Wood	☐ LPS ☐ HPS ☐ Other ____W	☐ O.H. ☐ U.G.	
		140160	1O27JL0 [[G]]	-121.84756807400	37.30767711860	Senter Rd	Lumec	C	240	☐ TS ☐ Oct/Galv ☐ Oct Painted ☐ Type 15 ☐ Wood	☐ LPS ☐ HPS ☐ Other ____W	☐ O.H. ☐ U.G.	
		140211	1O27JL0 [[G]]	-121.84730110300	37.30788345210	Senter Rd	Lumec	C	240	☐ TS ☐ Oct/Galv ☐ Oct Painted ☐ Type 15 ☐ Wood	☐ LPS ☐ HPS ☐ Other ____W	☐ O.H. ☐ U.G.	
		14053	1O27JL0 [[G]]	-121.84862813900	37.30910201370	Senter Rd	Lumec	C	240	☐ TS ☐ Oct/Galv ☐ Oct Painted ☐ Type 15 ☐ Wood	☐ LPS ☐ HPS ☐ Other ____W	☐ O.H. ☐ U.G.	
		14060	1O28JL0 [[G]]	-121.84823209100	37.30829397640	Senter Rd	Lumec	C	240	☐ TS ☐ Oct/Galv ☐ Oct Painted ☐ Type 15 ☐ Wood	☐ LPS ☐ HPS ☐ Other ____W	☐ O.H. ☐ U.G.	

Working Together with Local Utility

- LED Streetlights
  - Rebate incentive program
- "Smart" Controls
  - Metering Accuracy
  - Data format
  - Reports (example data)
    - Streetlight inventory
    - Installation dates
    - Read times
    - Energy consumption

Pacific Gas and Electric Company

Now and Future…

- PG&E Pilot Program: Network Controlled Dimmable Streetlights

- Agencies: Desirables
  - "Controls-ready" lights
  - One package (luminaires with controls)
  - System with minimal on-going fees
    - Maximize use of existing communication infrastructure
  - Compatibility / Interoperability

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